

**\*EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form #62

Sheet 1 of 1

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICELIST OF REFERENCES CITED BY APPLICANT(S)  
(Use several sheets if necessary)

APPLICANT

SHIN KITAMURA ET AL.

JUN 12 2003  
U.S. PATENT DOCUMENTS

FILING DATE

August 29, 2001

GROUP

2879

U.S. PATENT DOCUMENTS							
*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES/NO/ OR ABSTRACT
AN		0 836 217 A1	4/1998	EPO	H01J	29/94	
AN		99/58748	11/1999	WO	D01F	9/127	

## OTHER DOCUMENT(S) (Including Author, Title, Date, Pertinent Pages, Etc.)


EXAMINER

DATE CONSIDERED

12/11/03

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO 1449 (modified)		ATTY DOCKET NO.	APPLICATION NO.			
U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		03500.015729.	09/940,643			
LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)		APPLICANT	Shin Kitamura et al.			
Date Submitted to PTO: [DATE]		FILING DATE	GROUP			
		August 29, 2001	2879			
U.S. PATENT DOCUMENTS						
*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	
AN	5,982,091	11/99	Konishi	313	495	
	6,400,091 B1	06/02	Deguchi et al.	315	169.1	
	6,472,814 B1	10/02	Yamanobe et al.	313	495	
	5,872,422	02/99	Xu et al.	313	311	
	6,087,765	07/00	Coll et al.	313	309	
	2002/0009637A1	01/02	Murakami et al.	429	213	
	5,847,495	12/98	Yamanobe et al.	313	310	
	5,066,883	11/91	Yoshioka et al.	313	309	
	6,455,021 B1	09/02	Saito	423	447.3	
	6,471,936 B1	10/02	Chen et al.	423	658.2	
	4,728,851	03/88	Lambe	313	309	
	5,773,921	06/30/98	Keesman et al.	313	309	
	5,973,444	10/26/99	Xu et al.	313	309	
	5,935,639	8/10/99	Sullivan et al.	427	78	
	4,956,578	9/11/90	Shimizu et al.	315	3	
	5,185,554	2/9/93	Nomura et al.	313	495	
	6,448,709	9/02	Chuang et al.	313	497	
AN	6,204,597	03/01	Xie et al.	313	310	
EXAMINER	Initials <i>AN</i>		DATE CONSIDERED	11/7/04		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered.  
Include copy of this form with next communication to applicant.

Form #62

Sheet 1 of 11

FORM PTO 1449 (modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)			ATTY DOCKET NO.	APPLICATION NO.		
			03500.015729.	09/940,643		
			APPLICANT	Shin Kitamura et al.		
			FILING DATE	August 29, 2001		GROUP
U.S. PATENT DOCUMENTS						
*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AN	5,577,943	11/96	Vickers et al.	445	24	
	2002/136896	09/26/00	Takikawa et al.	428	408	
	5,192,240	03/09/93	Komatsu	445	24	
	5,214,346	05/25/93	Komatsu	313	309	
	5,382,867	01/17/95	Maruo et al.	313	309	
	5,612,587	03/18/97	Itoh et al.	313	309	
	6,313,572 B1	11/06/01	Yamada	313	310	
	6,135,839	10/24/00	Iwase et al.	445	24	
	2001/0006232	07/05/01	Choi et al.	257	10	
	4,816,289	03/89	Komatsu et al	423	447.3	
	5,443,859	08/95	Nagata	427	122	
	5,618,875	04/97	Baker et al.	524	495	
	5,690,997	11/97	Grow	427	249.1	
	6,129,602	10/00	Yamanobe	445	24	
	6,228,904	05/01	Yadav et al.	523	210	
	6,333,016	12/01	Resasco et al.	423	447.3	
	6,413,487	07/02	Resasco et al.	423	447.3	
AN	6,445,006	09/02	Brandes et al.	257	76	
EXAMINER	Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		DATE CONSIDERED	1/7/04		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Sheet 2 of 11

Form #62

FORM PTO 1448 (modified)			ATTY DOCKET NO. <b>03500.015729.</b>	APPLICATION NO. <b>09/940,643</b>			
U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE			APPLICANT <b>Shin Kitamura et al.</b>				
LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)			FILING DATE <b>August 29, 2001</b>	GROUP <b>2879</b>			
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME		CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AN	5,981,305	11/99	Hattori		438	20	
	6,290,564	9/01	Talin et al.		445	50	
	5,458,784	10/95	Baker et al.		210	674	
	6,331,690 B1	12/01	Yudasaka et al.		219	121.6	
	5,965,267	10/99	Nolan et al.		428	408	
	6,309,612 B1	05/02	Kotaki et al.		347	85	
	5,872,541	02/99	Yoshioka et al.		345	74.1	
	5,543,684	08/96	Kumar et al.		313	495	
	5,551,903	9/96	Kumar et al.		445	24	
	4,900,483	2/90	Witzke et al.		313	309	
	5,500,200	3/96	Mandeville et al.		423	447.3	
	5,726,524	3/98	Debe		313	309	
	2002/0047562 A1	04/25/02	Kitamura et al.		315	169.3	
	5,770,918	06/98	Kawate et al.		313	495	
	5,185,554	02/93	Nomura et al.		313	495	
	2002/0146958 A1	10/02	Ono et al.		445	24	
AN	2003/0048056 A1	03/03	Kitamura et al.		313	311	
EXAMINER	<i>Shin Kitamura</i>		DATE CONSIDERED		17/04		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Sheet 3 of 10

**\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.**

Sheet 4 of 10

**Form #82**

FORM PTO 1449 (modified)  U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY DOCKET NO. <b>03500.015729.</b>	APPLICATION NO. <b>09/940,643</b>			
LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)		APPLICANT <b>Shin Kitamura et al.</b>				
Date Submitted to PTO:[DATE]		FILING DATE <b>August 29, 2001</b>	GROUP <b>2879</b>			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES/NO/ OR ABSTRACT
AN ✓	11-194134	07/99	Japan	G01N	37/00	Abst., European Equivalent & 013 508 A2 & Counterpart U.S. Patent 6,313,572
AN ✓	11-139815	05/99	Japan	C01B	31/02	Abst.
AN ✓	0 535 953 B1	01/96	EPO	H01J	1/30	English
✓	0 290 026 B1	02/93	EPO	H01J	3/02	English
✓	1 122 344 A2	08/01	EPO	D01F	9/127	English
✓	WO 01/93292 A1	12/01	PCT	H01J	1/304	English
✓	WO 89/07163	08/10/89	Japan	D01F	9/12	English
✓	WO 90/07023	06/28/90	PCT	D01F	9/12	English
✓	08-115652	05/07/96	Japan	H01J	1/30	Abst. & Trans.
✓	0 758 028 A2	02/12/97	EPO	D01F	9/127	English
✓	WO 98/05920	02/12/98	PCT	G01B	7/34	English
✓	0 394 698 A2	10/31/90	EPO	H01J	1/30	English
✓	2000/277003	10/06/00	Japan	H01J	9/02	Counterpart U.S. Patent 2002/138886
✓	0 797 233 A2	09/24/97	EPO	H01J	1/30	English
✓	0 980 089 A1	02/16/00	EPO	H01J	1/30	English
✓	0 986 084 A2	03/15/00	EPO	H01J	1/30	English
✓	1 117 118 A1	07/18/01	EPO	H01J	1/312	English
AN ✓	0 716 439 A1	06/12/96	EPO	H01J	3/02	English
EXAMINER			DATE CONSIDERED	1/7/04		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Sheet 5 of 11

FORM PTO 1449 (modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)	ATTY DOCKET NO. <b>03500.015729.</b>	APPLICATION NO. <b>09/940,643</b>				
	APPLICANT <b>Shin Kitamura et al.</b>					
	FILING DATE <b>August 29, 2001</b>	GROUP <b>2879</b>				
	FOREIGN PATENT DOCUMENTS					
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES/NO/ OR ABSTRACT
AN ✓	2-112125	04/24/90	JAPAN	H01J	1/30	Abst. & Counterpart U.S. Patent 4,856,576
✓	3-20941	01/29/91	JAPAN	H01J	31/12	Abst. & Counterpart U.S. Patent 5,185,554
✓	5-211029	08/20/93	JAPAN	H01J	1/30	No
✓	8-264109	10/11/96	JAPAN	H01J	1/30	Abst.
✓	9-82214	3/28/97	JAPAN	H01J	1/30	Abst. & European Equivalent 0 716 438
✓	1 113 478 A1	07/01	EPO	H01J	3/02	English
✓	0 913 508 A2	05/06/99	EPO	D01F	9/127	English
✓	09-188600	07/22/97	Japan	C30B	29/62	Abst.
✓	A1 443 865	08/28/91	EPO	H01J	21/10	English
✓	04-212236	03/08/92	Japan	H01J	1/30	Counterpart U.S. Patents 5,182,240, 5,214,346 & EP 0 443 663
✓	03-295131	12/26/91	Japan	H01J	1/30	Counterpart U.S. Patents 5,182,240, 5,214,346 & EP 0 443 663
✓	05-159696	06/25/93	Japan	H01J	1/30	Counterpart U.S. Patents 5,382,678, EP 0 535 853
✓	05-198253	08/06/93	Japan	H01J	1/30	Counterpart U.S. Patents 5,382,678, EP 0 535 853
AN ✓	05-274997	10/22/93	Japan	H01J	1/30	Abst. & Counterpart U.S. Patent 5,612,587
EXAMINER			DATE CONSIDERED	1/7/04		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 608; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO 1449 (modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)	ATTY DOCKET NO.	APPLICATION NO.	
	03500.015729.		09/940,643
	APPLICANT	Shin Kitamura et al.	
	FILING DATE	GROUP	August 29, 2001

FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES/NO/ OR ABSTRACT
AN ✓	11-232997	08/27/99	Japan	H01J	1/30	Counterpart U.S. Patent 6,313,572 & EP 0 936 650
✓	0 936 650 A1	08/18/99	EPO	H01J	3/02	English
✓	10-289650	10/27/98	Japan	H01J	1/30	Counterpart U.S. Patent 8,136,334 & EP 0 871 144
✓	0 871 195 A1	10/14/98	EPO	H01J	1/30	English
✓	0 290 026 A1	11/88	EPO	H01J	3/02	English
✓	0 535 953 A2	4/93	EPO	H01J	1/30	English
✓	0 836 217 A1	04/98	EPO	H01J	29/94	English
✓	WO 99/58748	11/99	PCT	D01F	9/127	English
✓	CN 1181607A	5/98	China			English Counterparts: 0 836 217 & 99/58748
✓	1 187 161 A2	03/13/02	EPO	H01J	3/02	English
✓	1 102 299 A1	5/01	EPO	H01J	1/30	English
✓	1 096 533 A1	5/01	EPO	H01J	9/02	English
✓	WO 01/26130	4/01	WIPO	H01J	9/20	English
✓	GB 2 308 495	6/97	UK	H01J	1/20	English
✓	1 120 877 A1	8/01	EPO	H02G	5/06	English
AN ✓	1-309242	12/89	Japan	H01J	37/06	Abst.

EXAMINER

DATE CONSIDERED

1/7/04

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO 1449 (modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)		ATTY DOCKET NO. <b>03500.015729.</b>		APPLICATION NO. <b>09/940,643</b>		
		APPLICANT <b>Shin Kitamura et al.</b>				
		FILING DATE <b>August 29, 2001</b>		GROUP <b>2879</b>		
		FOREIGN PATENT DOCUMENTS				
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	
AN ✓	11-162334	6/99	JAPAN	H01J	9/02	Abst.
✓	2000-57934	2/00	JAPAN	H01J	1/304	Abst.
✓	2000-86216	3/00	JAPAN	C01B	31/02	Abst.
✓	2000-90809	3/00	JAPAN	H01J	1/304	Abst.
✓	2001-288625 A	10/01	Japan	D01F	9/127	Abst. & Counterpart U.S. Patent 2002/00009637 & EP 1 422 344
✓	0 433 507 A1	6/91	EPO	D01F	9/127	English
✓	03-260119	11/91	Japan	D01F	9/127	Abst. & Counterpart U.S. Patent 4,300,483
✓	2001-52598	2/01	Japan	H01J	1/316	Abst.
✓	2000-95509	4/00	Japan	C01B	31/02	Abst.
✓	0 451 208 B1	3/00	EPO	D01F	9/12	English
✓	2000-208028	7/00	Japan	H01J	1/304	Abst.
✓	0 936 650 A1	8/99	EPO	H01J	3/02	English
✓	08-298068	11/96	Japan	H01J	1/30	Abst.
✓	2001-162600	06/19/01	Japan	B82B	1/00	Abst.
✓	0 758 028 B1	09/11/02	EPO	D01F	9/127	English
✓	0 913 508 A3	5/99	EPO	D01F	9/127	English
AN ✓	10-149760	06/02/98	Japan	H01J	1/30	Abst.
EXAMINER <i>John Doe</i>			DATE CONSIDERED <b>1/7/04</b>			

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

**\*EXAMINER:** Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Page 452

DATE CONSIDERED

1/7/04

Sheet 9 of 11

FORM PTO 1449 (modified)		ATTY DOCKET NO. <b>03500.015729.</b>	APPLICATION NO. <b>09/940,643</b>
U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		APPLICANT <b>Shin Kitamura et al.</b>	
LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)		FILING DATE <b>August 29, 2001</b>	GROUP <b>2879</b>
OTHER DOCUMENT(S) (Including Author, Title, Date, Pertinent Pages, Etc.)			
AN	R.T.K. Baker et al., "Formation of Carbonaceous Deposits from the Platinum-Iron Catalyzed Decomposition of Acetylene," 37 J. Catal. 101-105 (1975).		
	R.T.K. Baker, "Catalytic Growth of Carbon Filaments," 27 (3) Carbon 315-323 (1989).		
	S. Iijima, "Helical Microtubules of Graphitic Carbon," Nature, Vol. 345, 56-58 (1991).		
	T. W. Ebbesen et al., "Large-Scale Synthesis of Carbon Nanotubes," Nature, Vol. 358, 220-222 (1992).		
	W. A. DeHeer et al., "Aligned Carbon Nanotube Films: Production and Optical and Electronic Properties," Science Vol. 268, 845-847 (1995).		
	T. Guo et al., "Catalytic Growth of Single-Walled Nanotubes by Laser Vaporization," Chem Phys. Lett., Vol. 243, 49-54 (1995).		
	A. G. Rinzler et al., "Unraveling Nanotubes: Field Emission from an Atomic Wire," Science, Vol. 269, 1550-1553 (1995).		
	W. A. DeHeer et al., "A Carbon Nanotube Field-Emission Electron Source," Science, Vol. 270, 1179-1180 (1995).		
	T. Kyotani et al., "Preparation of Ultrafine Carbon Tubes in Nanochannels of an Anodic Aluminum Oxide Film," Chem. Mater., Vol. 8, 2109-2113 (1996).		
	A. Thess et al., "Crystalline Ropes of Metallic Carbon Nanotubes," Science, Vol. 273 483-487 (1996).		
	H. Dai et al., "Single-Wall Nanotubes Produced by Metal-Catalyzed Disproportionation of Carbon Monoxide," Chem. Phys. Lett., Vol. 260, 471-475 (1996).		
	H. Dai et al., "Nanotubes as Nanoprobes in Scanning Probe Microscopy," Nature, Vol. 384, 147-150 (1996).		
	A. C. Dillon et al., "Storage of Hydrogen in Single-Walled Carbon Nanotubes," Nature, Vol. 386, 377-379 (1997).		
AN	W.P. Dyke et al., "Field Emission", Advances in Electronics and Electron Physics, Vol. 8, (1956) pp. 89-185		
EXAMINER	DATE CONSIDERED		1/7/04

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO 1449 (modified)		ATTY DOCKET NO. <b>03500.015729.</b>	APPLICATION NO. <b>09/940,643</b>
U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		APPLICANT <b>Shin Kitamura et al.</b>	
LIST OF REFERENCES CITED BY APPLICANT(S) (Use several sheets if necessary)		FILING DATE <b>August 29, 2001</b>	GROUP <b>2879</b>

## OTHER DOCUMENT(S) (Including Author, Title, Date, Pertinent Pages, Etc.)

AN	C.A. Mead, "Operation of Tunnel-Emission Devices", <i>Journal of Applied Physics</i> , Vol. 32, No. 4, (1961), pp. 646-652
✓	Toshiaki Kusunoki et al., "Fluctuation-Free Electron Emission from Non-Formed Metal-Insulator-Metal (MIM) Cathodes Fabricated by Low Current Anodic Oxidation", <i>Japanese Journal of Applied Physics</i> , Vol. 32 No. 11B, (1993), p. L1695-1697
✓	M.I. Ellinson et al., "The Emission of Hot Electrons and the Field Emission of Electrons from Tin Oxide", <i>Radio Engineering and Electronic Physics</i> , (1965) pp. 1290-1296
✓	G. Dittmer, "Electrical Conduction and Electron Emission of Discontinuous Thin Films", <i>Thin Solid Films</i> , Vol. 9, (1972) pp. 317-329
✓	M. Hartwell et al., "Strong Electron Emission from Patterned Tin-Indium Oxide Thin Film", <i>IEEE Trans. Ed. Conf.</i> , (1983) pp.519-521
✓	Hisashi Araki et al., "Electroforming and Electron Emission of Carbon Thin Films, <i>Journal of the Vacuum Society of Japan</i> , 1983 (with English Abstract on p. 22)
✓	Rodriguez et al., "Catalytic Engineering of Carbon Nanostructures," <i>Langmuir</i> 11, 3862-3866 (1995).
✓	W. Zhu Et Al., <i>Electron Field Emission From Nanostructured Diamond and Carbon Nanotubes</i> , <i>Solid State Electronics</i> , Vol. 45, 2001, pp. 921-928
✓	J.M. Bonard Et Al., <i>Field Emission From Carbon Nanotubes: The First Five Years</i> , <i>Solid State Electronics</i> , Vol. 45, 2001, pp. 893-914
✓	A.M. Rao et al., "In Situ-grown Carbon Nanotube Array of with Excellent Field Emission Characteristics," <i>Applied Physics Letter</i> , Vol. 76, No. 25, pp. 3813-3815 (2000).
✓	Cheol Jin Lee et al., "Carbon Nanofibers Grown on Sodalime Glass at 500 °C Using Thermal Chemical Vapor Deposition," <i>Chemical Physics Letters</i> 340, pp. 413-418 (2001).
✓	Sashiro Uemura et al., "Carbon Nanotube FED with Graphite-Nano-Fiber Emitters," <i>ISSN 1083-1312</i> , pp. 398-401.
AN	Q. H. Wang et al., "A Nanotube-Based Field-Emission Flat Panel Display," <i>Applied Physics Letters</i> , Vol. 72, No. 22, June 1998, pp. 2912-2913

EXAMINER

DATE CONSIDERED

1/7/04

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.